Crop Production News

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CROPS AGRICULTURE

EDITOR'S COMMENTS

by Sean Miller, PAg.
Provincial Specialist, Plant Disease

According to the August 15 Crop Report, combining has yet to start in Saskatchewan. Last year at this time, four per cent of the crop had been combined. For more information on the progress of the 2013 crop, consult the Saskatchewan Ministry of Agriculture's weekly Crop Report or on Twitter at @SKGovAg.

If you are applying a crop protection product at this time of year, please remember to follow the pre-harvest interval (PHI) guidelines. The PHI is the number of days that must pass between the last application of a pesticide and harvest. Harvest is defined as the cutting of the crop or the removal of the product from the plant. This includes direct combining, cutting (swathing) or grazing; it does not include swath-combining or baling for hay.

Refer to the crop protection product label or the product information in the 2013 Guide to Crop Protection for more information on a specific product's pre-harvest interval.

Insect pest surveys are an important part of the work done by growers and agronomists each year. The surveys give us notice of when to expect pests in the field and are a good way to predict the potential significance of infestations. This edition of the CPN includes a round-up of the insect surveys carried out during the 2013 growing season in Saskatchewan.

Crop Production News is a bi-weekly publication prepared primarily by provincial specialists with the Crops and Irrigation and Regional Services branches of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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Government of Saskatchewan
Ministry of Agriculture

Think Safety First!

Extra-long days of operating equipment result in fatigue. Remember to take frequent breaks, no matter how short they may be. Also, when the opportunity allows, take a nap because the body needs vital sleep time.

Accidents are preventable. Don't take chances! Review the operator's manual to refresh your memory on safety, especially if you are relatively new to the machinery.

Harvest runs late into the night with equipment operators and truck drivers working around dangerous equipment in poor visibility. When leaving the safety of the cab, wear a high-visibility vest or jacket so that others can easily see you.

Have a bountiful harvest.

HARVEST REMINDERS FOR OILSEED CROPS

by Venkata Vakulabharanam, PAg
Provincial Specialist, Oilseed Crops

We haven't had much warm weather lately and we know crops are at least two weeks behind in growth. However, warm weather is in the forecast for the next few days and harvest is going to arrive eventually! Here are some harvest considerations for oilseeds.

Canola

- Consider pre-harvest intervals (time between pesticide applications and cutting).

Canola pods before ripening.
Source: Saskatchewan Agriculture.

- Given the type of year we had, some crops have multiple growth stages, resulting in uneven maturity. Evaluate your risks and benefits when deciding when to swath.
- The Canola Council of Canada newsletter *Canola Watch* says that, on average during early fall, moisture loss may be about one to two per cent per day. This varies with wet and cool or hot and windy conditions. An approximately 10-per-cent increase in seed colour occurs with about five per cent moisture loss. Therefore, seed colour change from 30 to 50 per cent would require a 10-per-cent drop in moisture. This may take up to 10 days in cool weather but only three days in hot and windy weather.
- As most seeding was delayed this year, frost is a risk. Damaging frost usually occurs at around three to four degrees below zero. It is important to cut at least two days before the damaging frost occurs, provided the weather for those two days is conducive to dry-down. To read more, refer to the Saskatchewan Agriculture factsheet, Frost and Green Seed in Canola.
- Keep Malathion out of canola bins. Neither canola nor the bins used to store canola can be treated with Malathion. Spraying Malathion on canola will create export problems, as there is

either zero or very low tolerance for Malathion residues in canola seed in the export markets.

Flax

- Pay attention to pre-harvest intervals. Use glyphosate only when it is needed. We continue to receive questions from export markets with regards to glyphosate residues in flax seed. Furthermore, glyphosate application will seriously harm flax germination, so do not use it on crop intended for seed.
- Test, test, test! According to the Flax Council of Canada's Triffid Stewardship Program, all flax seed intended for planting, as well as flax seed entering the commercial grain handling system, must be tested for the presence of CDC Triffid. Buyers will request testing certificates for both planting seed and production. Also, remember that some flax buyers will only accept test results from certain labs. Check with your buyer prior to testing. For a list of approved testing labs, visit the Flax Council of Canada's website.
- Minimize harvest losses and avoid combining premature or tough bolls.
- Equipment used for harvesting, storing and transporting flax should be clean. The swather and combine should be cleaned properly before and after harvesting flax. Store your flax crop in a clean bin. Vacuum the bin prior to loading and after unloading to remove every flax seed in the bin. Thoroughly clean vehicles used to transport flax from field to farm and farm to elevator.
- Please do not save your farm seed for planting in 2014. The flax industry is asking growers to reboot their planting seed by purchasing certified flax seed for planting in 2014. If you are planting CDC Betune or CDC Sorrell, make sure to buy certified re-constituted seed for these varieties. This step is being taken by the industry in an effort to eliminate Triffid contamination in our flax production.

Mustard

- Roundup Weathermax was recently registered for preharvest application on condiment mustard through the minor use registration system. However, glyphosate residues can vary depending on the time of application, and may result in higher-than-acceptable levels of residue in mustard seed. Growers should consult their buyers/processors/exporters prior to such application. See the latest news release regarding this issue on SaskMustard's website.
- Straight-combining is the preferred option for high-quality mustard and will reduce the green seed count. Yellow mustard is the most resistant to pod shattering, followed by Oriental and brown mustard.
- Thoroughly clean harvest, transport and storage equipment. Make sure to remove insect excreta and body parts, ergot from volunteer cereals, and soft earth pellets and stones.
- To avoid heated seed, harvest mustard below 10 per cent moisture for short-term storage (less than five months) and below nine per cent moisture for longer-term storage.

PULSE CROP STORAGE AND HANDLING

by Dale Risula, PAg
Provincial Specialist, Special Crops

Properly stored pulse crops will maintain their value for a longer time, otherwise deterioration of quality and/or spoilage can occur. The following are some tips for storing pulse crops.

Clean the sample from green weed seeds and other high moisture materials as soon as possible. Pulse crops containing such materials are subject to spoilage from heating. Some processing companies may have equipment suitable to clean pulse crops, making them safe for storage and suitable for export.

Follow guidelines as prescribed for your pulse crop to ready them for long-term storage. Generally, they are safe when stored below 14 per cent moisture content and below 15 C. Aeration fans can help reduce moisture content and temperature to make the pulses suitable for long-term storage.

Supplemental heat may prove to be beneficial; however, exercise caution by avoiding maximum temperature exposures and time to bring the crop into condition. Temperatures above 45 C can be detrimental to seed germination. Limit drying to no more than five percentage points through each pass of the dryer.

Pulse crops often go through a "sweat" shortly after being placed in a bin. Moisture accumulates in the space between seeds in the bin, so be sure to monitor the condition in the bin for the first few weeks to ensure moisture build-up and heating is not occurring.

Aeration fans can reduce condensation in the bin by cooling the grain in the fall and warming it in the spring. Bringing the grain to a temperature close to the outside atmospheric temperature reduces the chance of condensation occurring. Adequate fan performance is required to accomplish this.

The Canadian Grain Commission (CGC) sets standards for grading pulse crops in Canada. More information can be obtained from your grain buyer or by contacting the CGC in your area.

WINTER INJURY IN ALFALFA

by Kevin France, PAg
Provincial Specialist, Forage Crops

Although alfalfa is a hardy crop well-suited to Saskatchewan growing conditions, it can be damaged by low winter temperatures. Diseases such as crown rot can compound the effects of cold temperatures on alfalfa, causing a reduction in yield and longevity.

To prevent winter injury in alfalfa stands, avoid cutting after August 15. Plants harvested after this date may not have six weeks to recover before a killing frost and may be susceptible to winterkill. A killing frost is considered -5 C or lower. Early fall is a critical time for alfalfa as the plants are storing the nutrients needed to survive the upcoming winter. Cutting plants during this period adds additional stress to the plants as they have to expend energy on regrowth as well as nutrient storage.

A fall application of fertilizer can also benefit future alfalfa productivity and longevity. If alfalfa makes up 50 per cent or more of the production in the stand and was properly inoculated at seeding, nitrogen is generally not a concern as the alfalfa will fix the nitrogen required by the stand. Phosphorus, potassium and sulphur are the three nutrients which should be considered in stands with a large proportion of legumes. Phosphorus and potassium are particularly important as they support root and nodule health and overwintering capability. Both of these nutrients can be applied in the fall as they are relatively immobile and will not leach into the soil or volatilize into the atmosphere like nitrogen. The most cost-effective way to maintain adequate soil fertility is to do a fall soil test.

Crown rot, a fungal disease, is common across Western Canada. Crown rot infection is most common in plants with mechanical injuries, insect damage, winter injury or nutrient deficiencies. Symptoms include dark brown areas that appear on plant buds or stems and then spread down to the crown. Brown, V-shaped dry rot occurs in the crown, and can extend into the taproot. Destruction of bud and crown tissue reduces new stem formation and weakens plants.

Winter crown rot occurs in northern areas of Western Canada, and is destructive in years with prolonged, deep snow cover. It develops under the snow in winter and early spring, and causes injury at temperatures just below freezing. Winter crown rot causes crown tissue to turn brown-black and soft. Immediately after the snow melts, fluffy white or pinkish mycelium can be seen in spreading, circular patches, but dries down to an inconspicuous brown layer when the snow cover disappears.

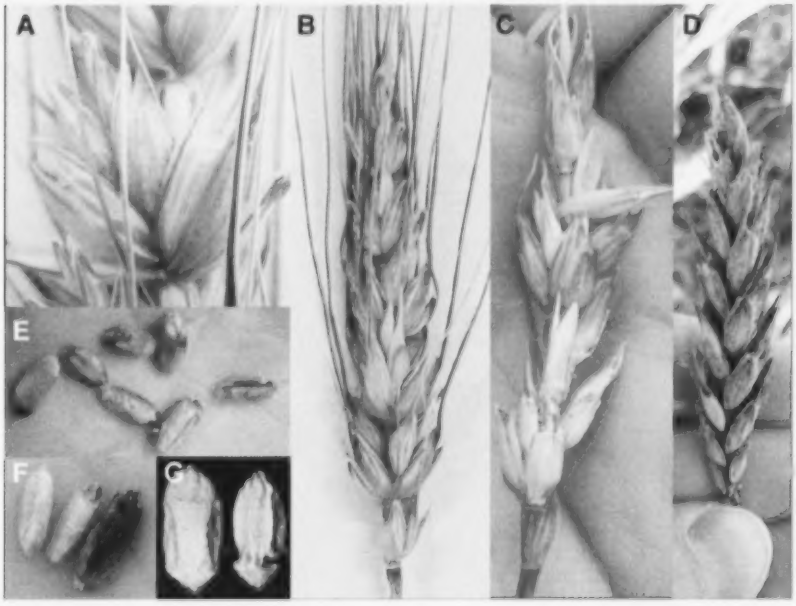
Adequate soil fertility, avoiding harvest after August 15, and using cold-tolerant and disease-resistant cultivars all reduce winter injury and increase stand longevity. Winter injury and crown rot can cause mortality in alfalfa, reducing yields and thinning the stand. If plant density is less than two to three plants per square foot, reseeding of the field should be considered.

SCOUT FOR PLANT DISEASES AT HARVEST

by Sean Miller, PAg
Provincial Specialist, Plant Disease

Although it is now too late to control them, sometimes it is easier to spot diseases late in the season and make a record of what occurred. Using this information regarding plant disease incidence in 2013, we may better plan possible disease management strategies and research initiatives in the future.

It is equally important for farmers to monitor fields and record the latest crop conditions, weather and pest observations from the 2013 season. Although there may be little time for traditional scouting during harvest, a bird's-eye-view from the combine or swather should not be discounted as a practical way to watch for disease. However, if you see problem areas, always take the time to take a closer look.



Wheat head/seed diseases/disorders: A) stripe rust, B) fusarium head blight, C) hail damage, D) sooty mould, E) black point, F) ergot, and G) fusarium damaged kernels. Source: Agriculture and Agri-Food Canada (A); and Saskatchewan Agriculture (B to G).

Cereal Diseases

Leaf spotting diseases and stripe rust are polycyclic diseases. This means they may be controlled after initial symptoms are observed by using a fungicide to prevent additional disease cycles from occurring. However, late in the season when it is too late for a fungicide, these diseases may spread to the heads, causing infection of the glumes (stripe rust or Septoria glume blotch) and smudge or black point on the seed (tan spot).

Fusarium head blight is a monocyclic disease. While *Fusarium* is a facultative fungus able to infect all plant parts, wheat is only susceptible to fusarium head blight (FHB) during flowering. Therefore, once you see symptoms it is too late to control. Bleaching of the glumes or fusarium-damaged kernels may be observed before or during harvest. Hail damage after heading may result in symptoms that could be mistaken for FHB. Hail is likely to break plant parts and affect one side of the plants (not just the heads) as well as affecting weeds and other plants in the area. If FHB is the culprit, only the crop will be affected (isolated glumes or all glumes above the point of infection) and there may be pink or orange spore masses.

Ergot also causes infection during flowering but does not appear until maturity. If harvest is delayed and senesced crops are exposed to moist conditions, saprophytic fungi may cause sooty moulds or contamination of seed. Have seed tested to ensure *Fusarium* levels (by FHB or saprophytes) are below threshold for planting.

Pulse Diseases

Pulse crops grown in a region with a history of host-specific diseases, such as ascochyta blight or anthracnose in lentils or the ascochyta complex in peas, will be at great risk of developing diseases under moist conditions. Diseases that affect other crops, such as root rot or sclerotinia white mould, or pathogens that can survive as saprophytes in the absence of a host, such as *Botrytis* and *Stemphylium*, also pose a risk when crops are heavy and the weather is moist. These diseases may have been observed earlier in the season, but will continue to be visible and can progress as long as the crop has green living tissue.

Pulse diseases: Brown patch affected by various lentil diseases. Watch for (inset clockwise from top left): ascochyta blight, botrytis grey mould, anthracnose, stemphylium blight and sclerotinia white mould.
Source: Saskatchewan Agriculture.

Pulse diseases: Ripening peas will support growth of harmless saprophytic organisms; however if the pods are affected by disease such as ascochyta leaf and pod spot (shown) or mycosphaerella blight, seed testing may reveal infection.
Source: Saskatchewan Agriculture.

Canola Diseases

As pods are forming, aster yellows may become visible as malformation of pods is more obvious. Discoloured plants or patches of crop should be investigated to differentiate between sclerotinia white mould (most common disease of canola in Saskatchewan surveys), blackleg or clubroot. For blackleg, search for lesions on leaves and stems with tiny black picnidia spots inside. Eventually infection will move to the base of the stem, at ground level. The best way to identify blackleg is to cut

Canola diseases: Clubroot of canola in Alberta. Check yellowed or prematurely ripened areas for galls
Source: Saskatchewan Agriculture.

Canola diseases: Discoloured areas of canola crop may reveal sclerotinia stem rot (top corner) or blackleg (bottom left).
Source: Saskatchewan Agriculture.

stems with pruning clippers to look for blackening and the extent of damage. Sclerotinia infection can cause lesions on leaves and stems and when the stem infection progresses, stem lesions will move up and down the stem. Stems will become bleached and will shred easily when twisted. Only sclerotinia stem rot will have black sclerotia bodies inside infected stems.

SASKATCHEWAN AGRICULTURE'S INSECT SURVEYS

by Brian Olson, AAg
Integrated Pest Management Agrologist

Surveys are a critical component of an integrated pest management program. The surveys serve a variety of purposes within the overall pest management strategy. Some of these include:

- Alerting producers of potential pest management problems within a region;
- Determining the presence of a potential economically damaging pest;
- Monitoring pest movements and expansion of range into new areas;
- Assisting the Canadian Food Inspection Agency in the determination of the presence of specific insect species;
- Aiding the development of models to predict insect outbreaks and other research projects; and
- Providing information on potential pest numbers to facilitate availability of control products by distributors.

Bertha armyworm pheromone trap.
Source: Saskatchewan Agriculture.

Saskatchewan Agriculture conducts several insect surveys with the primary purpose of monitoring changes in pest distribution or population. The survey data are used to generate maps which producers can use to plan for monitoring, prevention and control of pests.

Which insect surveys are conducted in the season and the extent of the surveys are largely the decision of the Provincial Pest Survey Committee. The committee is comprised of representatives from Saskatchewan Agriculture, Agriculture and Agri-Food Canada, Saskatchewan Crop Insurance Corporation and the canola industry. The committee reviews pest status, present survey protocols and options to make the results as useful and timely as possible. Saskatchewan Crop Insurance provides funding and staff for some of the provincial pest surveys.

The 2013 Insect Surveys

The Diamondback Moth Monitoring System is coordinated by Agriculture and Agri-Food Canada. Co-operators throughout the province conduct the monitoring. The purpose of this survey is to detect the arrival of the blown-in pest and alert producers of the potential for damage. Wind trajectories are monitored to identify possible movement of the pest into Saskatchewan.

The Bertha Armyworm Monitoring Program consists of approximately 130 co-operators reporting moth counts from approximately 190 sites across the province. The co-operators report weekly moth counts from a pheromone-based trapping system. The data collected is used to generate a weekly risk map based on cumulative moth counts. Bertha armyworm maps are posted on the Ministry of Agriculture's website.

The Cabbage Seedpod Weevil Survey is conducted in the southwestern, south-central and northwestern regions of the province. The purpose is to determine population levels and distribution. This pest continues to expand its range. This survey is coordinated by AAFC with assistance from Saskatchewan Agriculture's Regional Services personnel.

Pea Leaf Weevil Survey is conducted by Saskatchewan Agriculture staff in the southwest. This survey monitors the movement of this invasive pest into Saskatchewan.

The Grasshopper Survey is conducted by Saskatchewan Crop Insurance personnel and coordinated by Saskatchewan Agriculture. The collected data indicates the number of adult grasshoppers capable of laying eggs. This information is used to estimate the number of eggs present for overwintering and the potential hatch in

the spring. Areas with high potential risk to crops can be identified for the spring of 2014.

The annual Wheat Midge Survey is conducted in the fall. Most areas of the province except the extreme southwest are sampled for unparasitized midge pupae in the soil.

The Swede Midge Survey is conducted by Agriculture and Agri-Food Canada with cooperation from Saskatchewan Agriculture. It attempts to identify the presence of the midge.

A Small Hive Beetle Survey is conducted by Saskatchewan Agriculture with assistance from SCIC personnel. It is focused on beekeepers importing queens in the Yorkton area and in the south along the Manitoba border.

The Cereal Leaf Beetle Survey is conducted by Agriculture and Agri-Food Canada with assistance from Saskatchewan Agriculture and a private retailer. It is focused in the southwestern, northeastern and east-central areas of the province.

The Forage Insect Pest Survey is coordinated by Agriculture and Agri-Food Canada with assistance from Saskatchewan Agriculture's Regional Services personnel. The survey is province-wide and looks for the presence of parasitoids as well.

A Canada-wide survey of wireworm continues. This survey is coordinated by AAFC from Agassiz, B.C., and focuses on speciation.

The Cutworm Survey is coordinated out of AAFC, Lethbridge. Samples are collected and shipped for identification.

INSECT MONITORING IN THE FALL

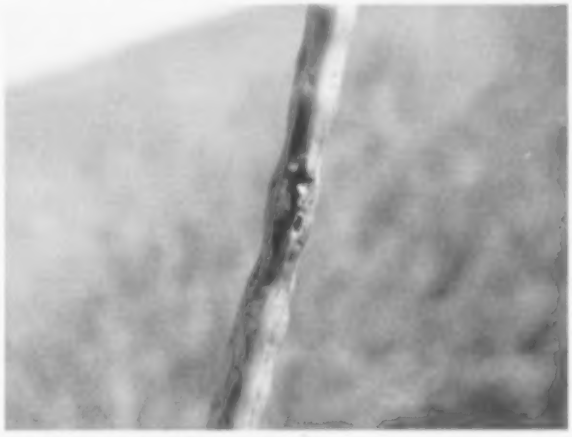
by Danielle Stephens, AAg
Agrologist Intern (Crops)

Cabbage seedpod weevil

If you have cabbage seedpod weevil in your area, field monitoring should be done again in August and into September as the canola ripens. Cabbage seedpod weevils were found earlier this year in southern Saskatchewan from the Alberta border to Regina, and in the west of the province from north of Highway 7 to RMs No. 319 to 321.

Cabbage seed pod weevil.
Source: Saskatchewan Agriculture.

After mating, the adults can lay their eggs in the developing pods of canola, carinata and every mustard species except yellow mustard. The larvae hatch and eat many of the seeds in the pod during their larval stages, a period of roughly 50 days. They then chew an exit hole out of the pod, dropping to the ground to pupate. The exit hole in the pod is the classic sign to look for when fall scouting and may be easier to spot than the weevils themselves.



Cabbage seed pod larvae exit hole.
Source: Saskatchewan Agriculture.

The next generation of adult weevils will emerge approximately 14 days later and can often be found feeding on the seedpods. The adult weevils drop to the ground when disturbed, so be sure to look at undisturbed areas ahead of where you walk. You

can also try using a sweep net to monitor their presence, though it is difficult to sweep in advanced canola.

Scouting at this time will help you determine if there will be a large population in the area that could be an issue during the next growing season. As with other pests, high numbers of cabbage seedpod weevils in the fall may not translate into high numbers in the following year. Spring populations will depend on overwintering success, spring conditions and levels of parasitism of the adult weevils.

Insects associated with grain storage

As everyone gears up for harvest, it is important to remember to get your bins ready for the impending crop. Proper cleaning and maintenance of your bins can help prevent insect problems in your stored grain.

There are two main categories of insects that might infect stored grain: primary and secondary insects. Primary insects, either as larvae or larvae and adults, can infect stored grain and feed on the grain to complete their life cycles. In Saskatchewan, primary insects are mostly beetle species such as the rusty grain beetle, the red flour beetle and the sawtoothed grain beetle. If you have had primary insect issues in the past, you might want to consider treating your bin with diatomaceous earth or Malathion before it is used for storage this year. **Note: oilseeds such as canola cannot be stored in bins treated with Malathion for at least six months.**

The secondary insects that can be found in stored grain are insects that feed on the fungus from spoiled grain. These secondary feeders can be a variety of insects such as the foreign grain beetle, grain mites and psocids (book lice). These insects can be a larger problem in years when grain is taken off tough or damp. To prevent secondary insect infestation, store grain dry and keep it cool.

It is important to identify insects in your grain correctly as the presence of secondary insects indicates that there is a spoilage problem in your grain. Treating for insects will not stop any fungus or mould problems. The foreign grain beetle (secondary insect) looks similar to the rusty grain beetle (primary insect); however, the foreign grain beetle can climb the sides of a jar, whereas the rusty grain beetle cannot.

If primary insects are found in stored grain, treatment is necessary. The Canadian Grain Commission does not accept grain with primary insects into the supply chain. Treatment is usually chemical (read labels and restrictions before use) or mechanical (using pneumatic grain-handling equipment or grain vacuums).

CROP PROTECTION LAB NEWS

by Cecilia Peluola, PAg
Supervisor, Crop Protection Laboratory

Root rots in flax, canola, pea, lentil and chickpea were among the most frequently submitted samples in the last two weeks. These rots are caused by some common rot pathogens such as *Rhizoctonia solani, Pythium* sp., *Botrytis cinerea* and *Fusarium* spp. Stemphylium blight caused by *Stemphylium botryosum* was also common on lentil samples submitted to the laboratory. The pathogen is a saprophyte in nature but can infect lentil and other legumes at all stages of crop development. Wet weather in summer promotes its infection and spread, which is pronounced on the upper leaflet of lentil plants. Severely infected crops appear cream to light beige in colour. This should not be mistaken for blossom blight caused by *Botrytis cinerea*. For more information refer to Saskatchewan

White heads in wheat (see next page). Photo courtesy of Saskatchewan Agriculture.

Agriculture's lentil factsheets.

Wheat and barley samples with symptoms such as white heads, yellowing/browning of leaves and kernel infection were also frequently submitted. Submitters were wondering if this is caused by Fusarium head blight or aster yellows or by an environmental effect such as heat or drought. Most of these samples tested negative for Fusarium head blight. There are various other possible causes of white head symptoms in cereal. For more information refer to the article White Heads in Wheat? in the August 3, 2012, issue of the Crop Production News.

Environmental disorders and chemical injuries were also apparent on samples of cereals such as wheat, barley, oat and other crops such as flax, canola and lentil.

Diseases/disorders

Common leaf spot and northern anthracnose of red clover – *Pseudopeziza medicaginis* and *Kabatiella caulivora*.

Root rot of flax, canola, lentil and pea – *Rhizoctonia solani, Botrytis cinerea, Pythium* sp. *and Fusarium* spp.

Stemphylium blight on lentil leaflets.

Foot rot of pea – *Phoma medicaginis*.

Anthracnose of lentil – *Colletotrichum truncatum*.

Stemphylium blight of lentil – *Stemphylium butryosum*.

Halo blight of oats- *Pseudomonas coronafaciens*.

Dutch elm disease (DED)

DED samples submissions to the laboratory increased significantly in July and August. In the same way, positive samples also increased significantly. More than half of submissions tested positive for Dutch elm disease caused by fungus pathogen *Ophiostoma nova-ulmi* and few were positive for Dothiorella wilt.

Insects

An insect sample submitted in the last two weeks was identified as the Argus tortoise beetle (*Chelymorpha cassidea*).

Weeds

A weed submission was identified as Japanese brome (*Bromus japonicas*).

The Crop Production News is a publication of the Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture
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